

What is claimed is:

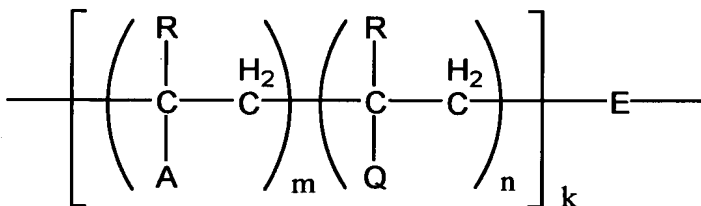
1. A copolymer comprising:

a polyethylene segment which is a main chain;

a reactive silicon-containing group which is a side group of the polyethylene segment; and

a polycondensation segment bonded to the polyethylene segment, which is a part of the main chain together with the polyethylene segment or a side chain with respect to the polyethylene segment.

2. A copolymer comprising a repeating unit represented by the following formula



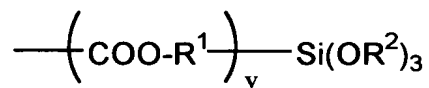
wherein, A is a reactive silicon-containing group, R is each independently a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, Q is a group compatible with the reactive silicon-containing group, E is a polycondensation segment which is a part of a main chain, or a polyethylene segment having a polycondensation segment as a side chain, m is an integer of 1 or more, n is an integer of 0 or 1 or more, and k is an integer of 1 or more.

3. A copolymer according to Claim 1 or 2, wherein said reactive silicon-containing group is an alkoxysilyl-containing group.

4. A copolymer according to Claim 1 or 2, wherein said polycondensation segment is a segment of polycarbonate, polyarylate or

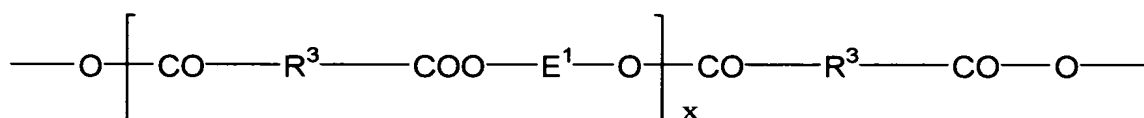
polysulfone.

5. A copolymer according to Claim 2, wherein said A has a structure represented by the following formula



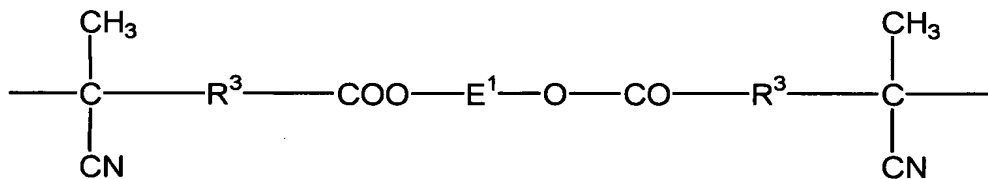
wherein, R<sup>1</sup> is an alkylene group having 1 to 10 carbon atoms or an arylene group having 6 to 20 carbon atoms, R<sup>2</sup> is an alkyl group having 1 to 10 carbon atoms, and y is 0 or 1.

6. A copolymer according to Claim 2, wherein said E has a structure represented by the following formula



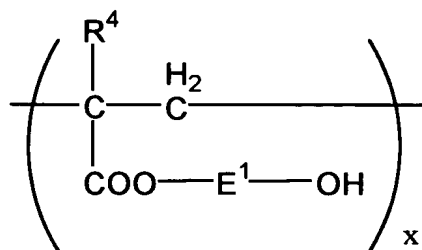
wherein, E<sup>1</sup> is a segment of polycarbonate, polyarylate or polysulfone, R<sup>3</sup> is each independently an alkylene group having 1 to 10 carbon atoms or an arylene group having 6 to 20 carbon atoms, and x is an integer of 1 or more;

or the following formula



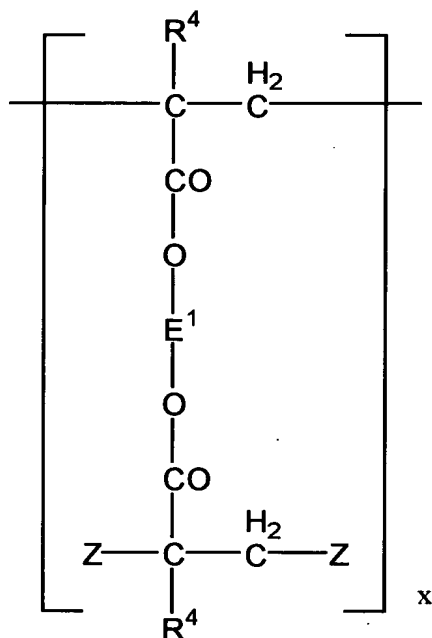
wherein, E<sup>1</sup> and R<sup>3</sup> are the same as defined above.

7. A copolymer according to Claim 2, wherein said E has a structure represented by the following formula



wherein, E<sup>1</sup> is a segment of polycarbonate, polyarylate or polysulfone, R<sup>4</sup> is a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and x is an integer of 1 or more;

or the following formula



wherein, E<sup>1</sup>, R<sup>4</sup> and x are the same as defined above, and Z is each independently a segment of another polymer.

8. A copolymer according to Claim 2, wherein said Q is a hydrogen atom, a carboxyl group, an alkoxycarbonyl group having 1 to 9 carbon atoms, an alkyl group having 1 to 8 carbon atoms, an aryl group having 6 to 20 carbon atoms or a halogen atom.

9. A method of producing a copolymer according to Claim 1 or 2,

comprising the step of radical-polymerizing a monomer mixture containing an unsaturated monomer having a reactive silicon-containing group and an unsaturated monomer compatible with said reactive silicon-containing group by using a macropolymerization initiator having a polycondensation segment.

10. A method of producing a copolymer according to Claim 1 or 2, comprising the step of radical-polymerizing a monomer mixture containing an unsaturated monomer having a reactive silicon-containing group, an unsaturated macromer having a polycondensation segment and an unsaturated monomer compatible with said reactive silicon-containing group.

11. A method according to Claim 9 or 10, wherein said reactive silicon-containing group is an alkoxysilyl-containing group.

12. A method according to Claim 9 or 10, wherein said polycondensation segment is a segment of polycarbonate, polyarylate or polysulfone.

13. A method of producing an organic-inorganic hybrid polymeric material, comprising the step of hydrolyzing and polycondensing the copolymer according to any one of Claims 1 to 8.

14. A method of producing an organic-inorganic hybrid polymeric material, comprising the step of hydrolyzing and polycondensing the copolymer of any one of Claims 1 to 8 in the presence of a metal, a metal alkoxide compound, a metal oxide, a metal complex or an inorganic salt selected from the group consisting of Si, Ti, Zr, Al, Fe, Cu, Sn, B, Ge, Ce, Ta and W.

15. An organic-inorganic hybrid polymeric material produced by the method according to Claim 13 or 14.